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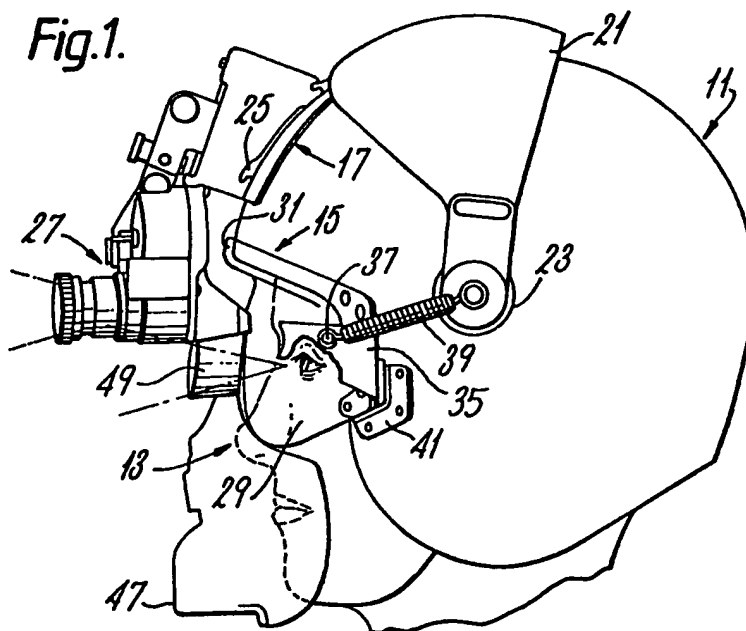
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## (54) Helmets

(57) A helmet (11), e.g. for an aircraft pilot, provided with a visor (29) shaped so as to fit within the upper part of the helmet face aperture (13) without protruding appreciably forward of the helmet brow (15) to avoid interference with other helmet mounted devices such as a night vision goggle (27) and a sun visor (21). The visor (29) is shaped to take up an operative position against abutment surfaces on parts (15, 41) of the helmet (11) under the action of spring means (39) which also allows the visor (29) to be moved upwards to an inoperative position.



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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.  
This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1982.

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Fig.1.

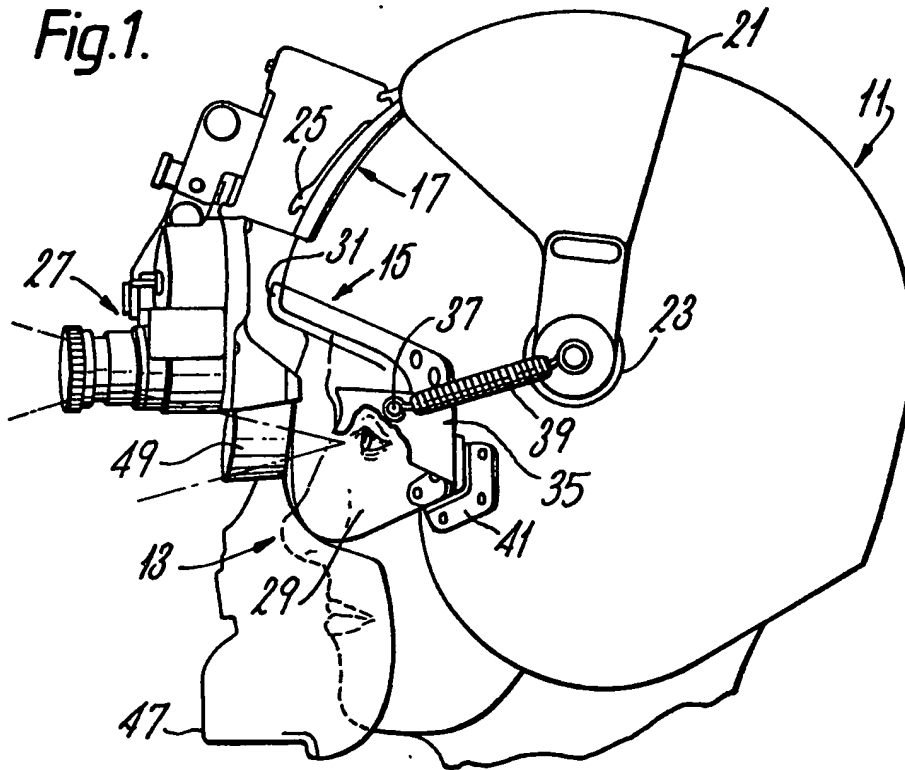


Fig.4.

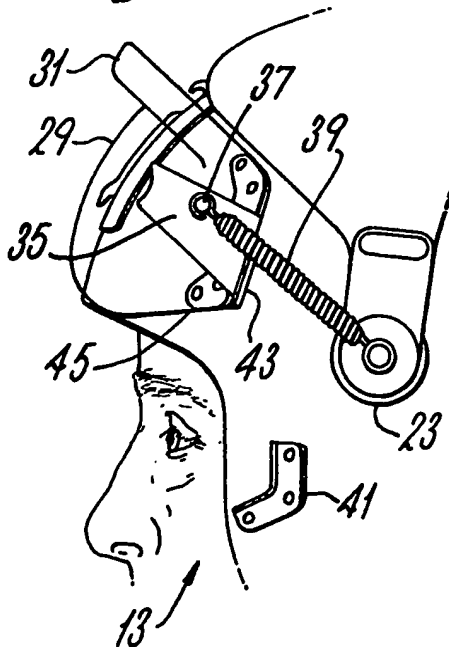
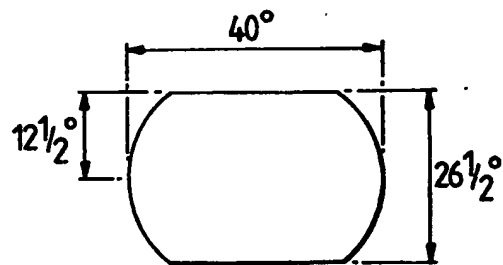


Fig.5.



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Fig. 2.

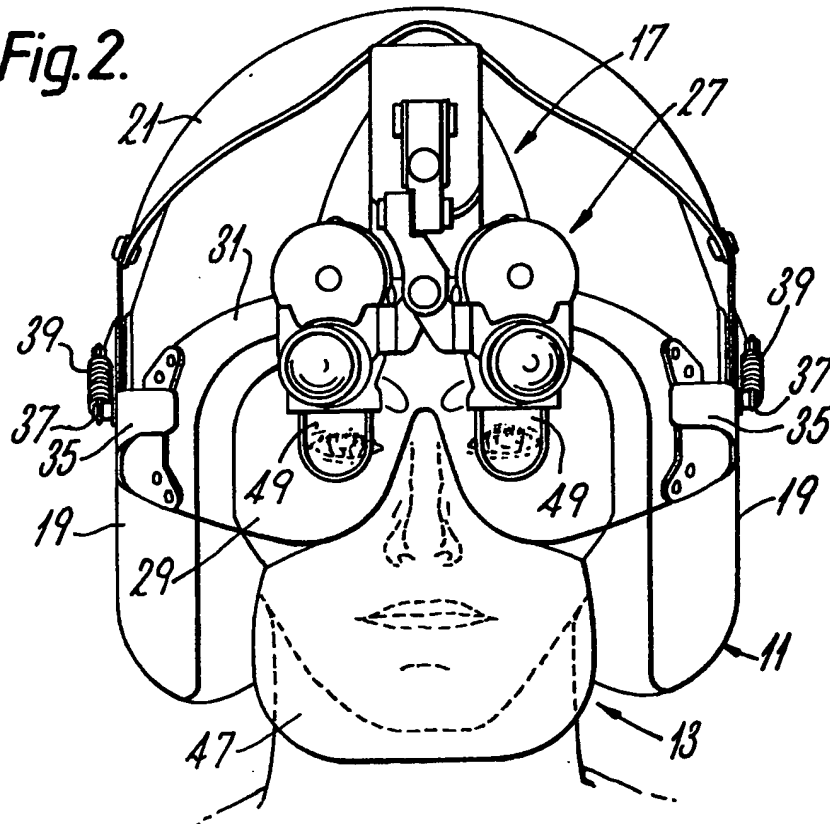
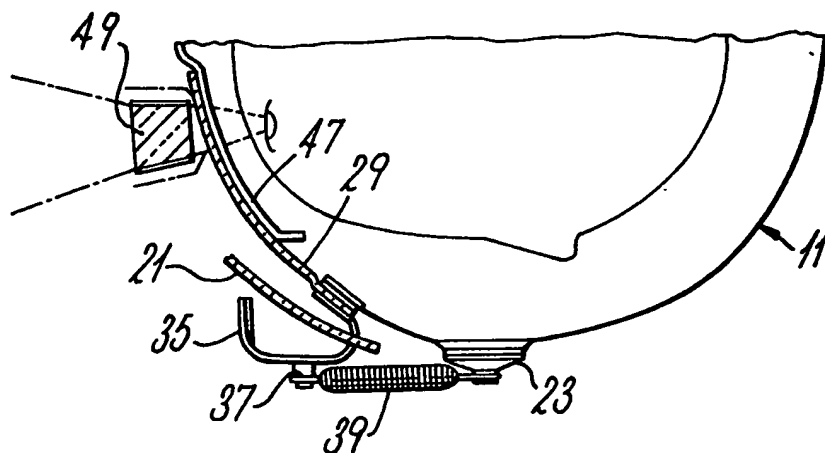


Fig. 3.



## SPECIFICATION

### Helmets

This invention relates to helmets, more especially to helmets for use by aircraft pilots.

5 The modern pilot's helmet, for military aircraft in particular, is an object of considerable complexity. The design of the helmet must be compatible with the requirement for the pilot to wear the so-called X-Mask. At the same time there may be required, and  
10 the helmet must therefore be compatible with, the fitting of a night vision viewing device to the helmet. For this purpose a bracket may be secured to the sincipital region of the helmet, and the night vision device may then be provided with a releasable  
15 fastening by which the night vision device is attached to the helmet when it is desired to employ this facility. Apart from these elements the helmet may be, and generally is, fitted with a pivotal sun visor.

20 Within such a helmet configuration it is also required to fit a mandatory clear visor.

It is an object of the present invention to provide a pilot's helmet incorporating a visor arrangement by which a clear visor may be provided in a manner  
25 which is compatible with the several, to some extent conflicting, requirements referred to above.

According to the present invention, a helmet having a face aperture includes a visor arrangement comprising: a visor shaped to fit substantially within  
30 an upper portion of the helmet face aperture so as not substantially to protrude forward of a brow portion of the helmet; at each side of the helmet, spring means, connected between the helmet and the visor, and serving to urge the visor to take up a  
35 position within said face aperture; and abutment surfaces on the helmet so shaped and positioned as by contact with co-operating surfaces of the visor under the action of said spring means to guide and constrain the visor to adopt a predetermined  
40 operative position with respect to the helmet within said face aperture.

One helmet in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings in  
45 which:—

Figure 1 is a pictorial side view showing the helmet with a clear visor in the operative position together with a night vision viewing device and a sun visor;

50 Figure 2 is a pictorial front view of the arrangement of Figure 1;

Figure 3 is a diagrammatic half plan view illustrating the relative positions of certain components of the arrangement.

55 Figure 4 is a scrap diagram showing, in elevation, the clear visor in the parked position, the night vision device being removed from the helmet; and

Figure 5 represents the field of view through the night vision device represented and available by  
60 virtue of the disposition of the clear visor with respect to the helmet.

Referring to the drawings, the helmet comprises a shell 11 having a face aperture 13, the brow portion 15, the sincipital region 17, and the cheek portions

65 19 of the helmet shell 11 being also indicated for reference purposes.

The helmet is provided with a sun visor 21 pivotally connected to the helmet shell 11, the shell 11 being provided with side projections 23 which  
70 serve as bearings for the sun visor 21. In the sincipital region 17 of the helmet shell 11 there is an attachment member 25 for receiving a binocular night vision viewing device 27. The device 27 is attached to the member 25 by a releasable element  
75 (not shown) forming part of the viewing device. The releasable element may, for example, consist of a spring biased caliper arrangement. By squeezing together two levers against the bias the calipers open, and when released the calipers engage the  
80 attachment member 25. For effective viewing, that is to say, for a relatively large field of view, the device 27 needs to be close to the pilot's eyes when in use. This means that the eye pieces of the device 27 must be substantially within the face aperture 13.

85 This requirement in respect of the night vision viewing device presents a considerable problem in respect of the provision of a clear visor for the pilot which must be capable of being used when the viewing device is being used. Thus the visor must  
90 also be positionable within the face aperture, but deeper into the face aperture than the night vision viewing arrangement, and at the same time provision must be made for moving the visor from the operative to a parked position, e.g. at or above  
95 the brow of the helmet shell. Hence, if the clear visor is pivotally mounted on the helmet in a comparable manner to the sun visor 21 a relatively complex mechanism involving multidimensional motion between operative and inoperative positions is  
100 required.

In accordance with the present invention a clear visor 29, e.g. of transparent plastics material, is provided having a forwardly projecting lip 31  
around its upper margin.

105 At the rear marginal surfaces of the visor 29 there are two hook shaped metal handling members 35 rivetted to the clear plastic visor material. Each of the members 35 has an outwardly projecting pin 37. Connected between the projections 23 of the helmet  
110 shell 11 and the pins 37, at each side of the helmet, there is a helical spring 39.

In addition to these elements there are two visor locator members 41 rivetted one to each side of the helmet shell 11, the members 41 each being L-  
115 shaped so as to provide an angled generally forward facing surface.

The lip 31 of the visor is adapted to locate snugly along a substantial portion of the marginal surface of the brow portion 15 of the helmet shell 11  
120 adjacent the face aperture 13. The locator members 41 serve as abutments whose forward facing angled surfaces are adapted to be contacted by rear and adjacent lower edge portions 43, 45, respectively on each side of the visor 29, the angle between these  
125 edge portions being complementary to the shape of the associated locator member 41.

In operation the visor 29 may be moved between an operative position and an inoperative i.e. parked position as shown in Figures 1 and 4. In s

doing the springs 39 are extended or contracted (depending on direction of movement). When moved to the operative position, prior to attachment of the night vision device 27 for example, the abutments constituted by the locators 41 together with the marginal surface of the brow portion 15 of the helmet shell 11 serve by contact with the co-operating surfaces on the visor 29 to guide and constrain the visor 29 to take up a precisely defined position with respect to the face aperture 13.

In the parked position, the visor is held against the sincipital region 17 of the helmet shell 11, over the attachment member 25, under the action of the springs 39.

The hook shaped handling members 35 are, of course, employed by the pilot for the purpose of moving the visor 29.

As may be seen, the arrangement is compatible with the disposition of the X-Mask 47 for the pilot, and it permits the eyepieces 49 of the night vision device 27 to be brought to a position close to the eye.

Furthermore, with the night vision viewing device 27 removed, the clear visor 29 and the sun visor 21 may be used together, as illustrated in Figure 3.

With the arrangement depicted and using a night vision device 27 of the type described and claimed in Patent specification GB—A—2,144,558 a field of view of the magnitude shown in Figure 5 is achievable.

#### CLAIMS

1. A helmet having a face aperture including a visor arrangement comprising a visor shaped to fit substantially within an upper portion of the helmet face aperture so as not substantially to protrude forward of a brow portion of the helmet; at each side of the helmet, spring means, connected between the helmet and the visor, and serving to urge the visor to take up a position within said face aperture; and abutment surfaces on the helmet so shaped and positioned as by contact with co-operating surfaces of the visor under the action of said spring means to guide and constrain the visor to adopt a predetermined operative position with respect to the helmet within said face aperture.

2. A helmet according to Claim 1 wherein said co-operating surfaces of the visor comprise a surface of a lip portion of the visor which is shaped and

positioned so as to co-operate with a substantial portion of the marginal surface of said brow portion of the helmet adjacent said face aperture.

3. A helmet according to Claim 2 wherein said lip portion projects forwardly of the main body of the visor.

4. A helmet according to any one of the preceding claims wherein said co-operating surfaces of the visor comprise edge portions of the visor on each side of the visor.

5. A helmet according to Claim 4 wherein said edge portions respectively co-operate with surfaces of locator members positioned one on each side of the helmet.

6. A helmet according to Claim 5 wherein said locator members are each substantially L-shaped so as to provide an angled generally forward facing surface.

7. A helmet according to any one of the preceding claims wherein said spring means allow movement of the visor against the action of the spring means to a non-operative position above the face aperture.

8. A helmet according to Claim 7 wherein said non-operative position is with the visor held against a sincipital region of the helmet under the action of said spring means.

9. A helmet according to any one of the preceding claims including an attachment member for receiving a night vision viewing device having at least one eyepiece which is positioned substantially within said face aperture when the viewing device is attached to the helmet and in use, said visor, when in its operative position, then lying between said eyepiece and an eye of a wearer of the helmet.

10. A helmet according to any one of the preceding claims wherein said visor is a clear visor.

11. A helmet according to any one of the preceding claims wherein said spring means comprises two helical springs one on each side of the helmet, each said spring being connected at one end to the visor and at the other end to the helmet.

12. A helmet according to Claim 11 wherein said helmet includes a further visor pivotally mounted on the helmet, each said spring being connected at said other end to a respective pivotal connection between said further visor and the helmet.

13. A helmet according to Claim 1 and substantially as hereinbefore described with reference to the accompanying drawings.